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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/914,704	05/23/2002	Alexander Dyck	1999/F-044	9977

7590 06/01/2004

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EXAMINER

MENON, KRISHNAN S

ART UNIT PAPER NUMBER

1723

DATE MAILED: 06/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/914,704

Applicant(s)

DYCK ET AL.

Examiner

Krishnan S Menon

Art Unit

1723

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 May 2004.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 19-44 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,19-22 and 24-44 is/are rejected.
- 7) ☒ Claim(s) 23 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

Claims 1,2, and 19-44 are pending in this application after the preliminary amendment.

#### ***Claim Rejections - 35 USC § 102***

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1,2,19-22, 24,25,27-30, 32-37 and 39 are rejected under 35 U.S.C. 102(a/e) as being anticipated by Helmer-Metzmann et al (US 5,834,566)

Helmer-Metzmann teaches membranes containing the repeat units (I) and (II) of claims 1 and 2 in columns 3 and 4, where, X can be -CO- as in claim 19, Ar1 and Ar2 can be phenylene or biphenylene as in claim 20, further comprise repeat unit (III) of claim 21, molar proportion of the repeat units (I) and (III) overlaps the range 10-50% and 90-50% respectively as in claim 22 (see col 4), ion exchange capacity falls in the range between 0.5 and 3.0 meq/g as in claim 24 and 37 (Tables), a membrane comprising a sulfonated polymer as in claim 25 (abstract), polymer component is sulfonated (abstract, cols 3 and 4) as in claim 27.

Claim 29 recites the method for making the membrane using the polymer of claim 1, which Helmer-Metzmann teaches in Examples 1-20 by dissolving in NMP, coating on a support and then drying. Solvent in NMP, concentration of polymer is 10% as in claim 30. Water washing as in claim 32.

Ar1 and Ar2 are 1,3-phenylene or 1,4-phenylene as in claims 33 and 34, further comprises the repeating formula (III) of claim 35 (see col 4), formula II and III range overlaps 10-50% and 50-90% respectively as in claim 36, (col 4); forms of the polymer in Na or K salt form (see examples) as in claim 39. Membrane comprises a polyether sulfone, and has thickness in the range 20 and 60 microns as in claim 38 (see structures in cols 2-5; col 7 lines 40-45).

2. Claim 26 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Helmer-Metzmann (566).

Proton conductivity of the membrane, being same material as in the instant claim, is an inherent property of the membrane. Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection. "There is nothing inconsistent in concurrent rejections for obviousness under 35 U.S.C. 103 and for anticipation under 35 U.S.C. 102." In re Best, 562 F.2d 1252, 1255 n.4, 195 USPQ 430, 433 n.4 (CCPA 1977). This same rationale should also apply to product, apparatus, and process claims claimed in terms of function, property or characteristic. Therefore, a 35 U.S.C. 102/103 rejection is appropriate for these types of claims as well as for composition claims.)

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Helmer-Metzmann (566).

Helmer-Metzmann teaches all the limitations of claim 29. Claim 31 adds the further limitation of converting salt form to acid form by acid treatment, on which Helmer-Metzmann is silent, but teaches that the acid form can be converted to salt form by treating with NaOH, etc. (see col 8 and tables). However, it would be obvious to one of ordinary skill in the art at the time of invention that the salt form of an ion exchange membrane (sulfonated) can be converted in turn to acid form by treatment with acid.

4. Claims 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ozcayir (334) in view of Bikson et al (US 5,364,454).

Ozcayir teaches all the limitations of claim 32 as above, except the washing with mineral acid in water. Bikson teaches that the method of making membranes from aromatic sulfonated polymers is well known (see col 1 lines 35-40), and therefore, it would be obvious to one of ordinary skill in the art at the time of invention to use such well known method to make the membrane, washing medium included.

5. Claims 28, 38 and 41-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Helmer-Metzmann (566) in view of Kawakami et al (4,971,695).

Helmer-Metzmann teaches all the limitations of claim 25. Claims 28 and 38 add the further limitation of the membrane thickness being 10-150 microns or 20-60 microns. Helmer-Metzmann (566) does not teach the membrane thickness. Kawakami teaches the thickness as between 0.5 to 10 mil (see col 5 lines 35-45). Claims 41-44 are combination of the membrane of claim 25 with fuel cells, capacitor and dialysis apparatus, which Helmer-Metzmann fails to teach. Kawakami teaches use of sulfonated hexafluoro polymer membranes in applications of electrochemical membrane (fuel cell, capacitors), such as electrodialysis as a dialysis membrane; and as battery separator membranes (fuel cells, capacitors), etc. (see col 2 lines 28-33). It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Kawakami in the teaching of Helmer-Metzmann for use of the membrane in the applications as taught by Kawakami because of the high thermal and mechanical stability above 100 deg C - see Helmer-Metzmann abstract.

Re the further limitations of claim 38, the polyether sulfone and polyether ketone are taught by Helmer-Metzmann (566) – col 4.

### ***Allowable Subject Matter***

Claim 23 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The closest prior art is Ozcayir (334) which teaches sulfonated polyimides. Claim 23 recites a polymer consisting essentially of a specific repeat unit, and such a polymer is not taught by the references, and is non-obvious to polymers disclosed in the references because of its unique structure.

### ***Response to Arguments***

Applicant's arguments, see pages 8 and 9 of the amendment filed 5/10/04, with respect to the rejection(s) of claim(s) 1,2, 19-22 and 24-44, as amended, under 35 USC 102(b) or 35 USC 103(a) over Ozcayir et al (US 5,618,334) are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made over another prior art Helmer-Metzmann (566).

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the


shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L Walker can be reached on 571-272-1151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Krishnan Menon  
Patent Examiner

  
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